

REMARKS

Claims 1-28 are pending in the application.

Claims 1-28 stand rejected.

Amendments to Drawings

The Examiner objected to the drawings for containing handwritten text. The drawings have been amended to address the Examiner's concerns. No new matter has been included in Figures 7A and 7B.

Rejection of Claims under 35 U.S.C. §103

Claims 1-28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chiussi et al., U.S. Patent No. 5,689,506 (Chiussi) in view of Somiya et al., U.S. Patent No. 6,438,107 (Somiya). Applicants respectfully traverse this rejection.

With respect to the references cited, Applicants respectfully note that Chiussi, in view of Somiya, fails to show, teach or suggest the limitations of claim 1. As mentioned in the Office Action, Chiussi does not disclose "communicating said last QSP to said egress linecard." Furthermore, Chiussi does not teach periodically combining an output queue status with a last QSP. (column 13 lines 39-50). Chiussi states that "backpressure bitmaps provide congestion feedback from the egress side of the output card to third stage modules; third stages modules to second stage crossbar modules; second stage modules to first stage modules; first stage modules to the ingress side of the output port card." In teaching that each module provides a backpressure bitmap to its upstream neighbor, Chiussi does not teach that the backpressure signals from an output queue and a last

module are combined with one another. (column 13, lines 39-50). Therefore, Chiussi does not disclose combining an output queue status with a last QSP. In conclusion, Chiussi fails to show, teach or suggest at least two limitations of claim 1: (1) communicating a last QSP to an egress linecard and (2) combining the last QSP with an output queue status.

The disclosure of Somiya also fails to show, teach or suggest both (1) communicating a last QSP to an egress linecard and (2) combining the last QSP with an output queue status, as claimed in claim 1. In column 1, line 65 to column 2, line 16 Somiya teaches that a source terminal transmits one resource management cell to a switch each time a predetermined number of user data cells are transmitted, but does not disclose that congestion information is collected for each switching element. Additionally, Somiya does not show, teach, or suggest collecting congestion information from a last switch or a last queue. Because Somiya does not disclose obtaining a last QSP, Somiya could not be expected to disclose (1) communicating the last QSP to an egress linecard or (2) combining an output queue status with the last QSP. (column 1, line 65 to column 2, line 16 and figure 1A).

Although both references fail to teach at least two limitations of claim 1, the Office Action asserts that the limitations of claim 1 are made obvious by Chiussi in view of Somiya. As previously mentioned, Chiussi discloses a system as follows: “backpressure bitmaps provide congestion feedback from the egress side of the output card to third stage modules; third stages modules to second stage crossbar modules; second stage modules to first stage modules; first stage modules to the ingress side of the output port card.” (column 13, lines 39-50). The Office Action suggests that, in view of Somiya, the system of Chiussi could be modified so that “the congestion control

information is collected for each switching element and forwarded to the output port card, where the data is collected into a backpressure bitmap and transmitted to all switching elements and input cards.” In order to provide such a system, Chiussi’s system would have to be modified to (1) forward congestion control information from each switch to the output card, (2) collect all the data into a backpressure bitmap, and (3) transmit the data to all switching elements and input cards.

Adding the disclosure of Somiya to the disclosure of Chiussi does not provide these three limitations. Somiya, in Figure 1A and column 1, line 65 to column 2, line 16, discusses control flow of resource management cells; however, in these cited portions of the reference, Somiya does not teach (1) forwarding congestion control information from each switch to the and output port or (2) collecting all the data into a single data structure (such as a backpressure bitmap). Furthermore, because Somiya does not collect congestion control information from each switch, Somiya could not teach (3) transmitting the information to all switching elements and input cards.

Therefore, it would not have been obvious to one of ordinary skill in the art to modify the system of Chiussi “so that the congestion control information is collected for each switching element and forwarded to the output port card, where the data is collected into a backpressure bitmap and transmitted to all switching elements and input cards.” Since it would not be obvious to one of ordinary skill in the art to modify the system of Chiussi to forward congestion control information to the output port card and combine that congestion information into a backpressure bitmap, it would no have been obvious to communicate congestion information from a last switch and combine that information with output card congestion information. Thus, it would not have been obvious to one of

ordinary skill in the art to combine the disclosures of Somiya and Chiussi to provide the limitations of claim 1, such as communicating a last QSP to an egress linecard and combining an output queue status with the last QSP, because Somiya and Chiussi fail to show, teach or even suggest these limitations, either in permissible combination with one another, or with the skill in the art at the time of invention.

Applicants are also unable to find the motivation in either Somiya or Chiussi to combine their disclosures. This is likely because the references are directed to different problems. Somiya discloses an apparatus and method of controlling the cell transfer rate in an ATM network containing a plurality of services such as an available bit rate service and an unspecified bit rate service. (column 1, lines 5-12). On the other hand, Chiussi focuses on an ATM switch, and discloses an ATM switch that provides minimum tree multicasting. (column 1, lines 38-42.). Chiussi provides no motivation to look to principles implemented in an entire ATM network to solve problems related to a single ATM switch, and Somiya provides no motivation to look to principles implemented in an ATM switch to handle congestion issues that result from providing multiple bit rate services in an ATM network. Therefore, neither Chiussi nor Somiya provides motivation to combine their references.

Additionally, one of ordinary skill in the art would find no motivation to combine Chiussi and Somiya because a combination of the references would fail to provide any additional benefits over any such benefits already provided by Chiussi and Somiya taken separately. Chiussi recognizes that multicasting ATM switches have continual problems with avoiding the congestion that occurs when delays in one output port affects the traffic destined to other output ports. (column 1, lines 38-43). Chiussi uses backpressure to keep an output port from consuming too much queue memory and to keep the queues

from overflowing and losing data. (column 13, lines 32-35). Somiya addresses the problem of keeping an allowed cell rate (ACR) between a peak cell rate (PCR) and a minimum cell rate (MRC) by looping resource management cells from an ABR source terminal through a network (column 1, lines 1-55).

Moreover, adding the teachings of Somiya and Chiussi would not provide any additional advantages over either reference taken alone. This is because Chiussi already has a solution to the problem recognized thereby, so provides no motivation to look elsewhere to improve that solution. Conversely, combining the teachings of Chiussi and Somiya would also fail to provide any additional advantages over Somiya taken alone because Somiya focuses on controlling cell rates and does not discuss the use of queues, as in Chiussi. Therefore, Somiya has no need to implement backpressure to keep queues from consuming too much memory, and would have no need of the techniques disclosed in Chiussi.

The Office action asserts that it would have been obvious to one of ordinary skill in the art to combine Somiya and Chiussi because this combination “would allow a centralized control instead of a distributed control as disclosed by Chiussi.” Applicants respectfully submit that this conclusion is unfounded because Somiya does not disclose a centralized control system. (figure 1A and column 1, line 65 to column2, line 16).

The Office Action also suggests that adding the teachings of Somiya to Chiussi would “simplify circuitry in the switching elements [of Chiussi] since they would no longer be required to pass backpressure signals.” First, Applicants respectfully submit that the resource management cells of Somiya and the backpressure signals of Chiussi cannot simply be equated with one another. Applicants respectfully submit that the resource management cells of Somiya are passed through each switch twice (as seen in

figure 1A), once upstream and once downstream. If the system of Chiussi, which passes backpressure signals downstream, was modified to pass backpressure signals both downstream and upstream, a loss would occur from more complex circuitry instead of a savings from simplified circuitry. Therefore, even if Chiussi's backpressure signals were equated with Somiya's resource management cells, one of ordinary skill in the art would not have been motivated to combine the disclosures of Chiussi and Somiya to provide Chiussi with centralized control, simplified circuitry, or to provide any additional benefits over any such benefits already provided by Chiussi and Somiya taken separately.

Applicants therefore respectfully submit that claim 1 clearly distinguishes over Chiussi in view of Somiya. Applicants submit that these arguments apply with equal force to claims 12 and 25-28. Applicants therefore respectfully submit that independent claims 1, 12 and 25-28, as well as claims 2-11 and 13-24, which depend on claims 1 and 12, are allowable for at least the foregoing reasons. Applicants therefore respectfully request withdrawal of the rejections based upon 35 U.S.C §103 (a). Accordingly, Applicants respectfully submit that claims 1-28 are in condition for allowance.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5084.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 18, 2004.

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Attorney for Applicants Date of Signature

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